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THE YALE UNIVERSITY SCHEME.

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THE ACADEMIC COLLEGE

AND

THE SCIENTIFIC COLLEGE

AT NEW HAVEN,

IN THEIR RELATIONS TO THE UNIVERSITY.

BY JAMES D. DANA.

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*A WORD OF EXPLANATION.*

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The following statement was called out by the unexpected publication of a familiar letter addressed to the Secretary of the Yale Graduates in Cincinnati. Some of the remarks in that letter, when made public, appeared to require an explanation not necessary when addressed to a company of Yalensians alone. At the same time there are doubtless some among the graduates of Yale College who will be surprised to learn how thoroughly their Alma Mater is adapting her instructions to the progress of science, and the demand for various sorts of preparation for life. The scheme is in its various points so nearly realized that it may rightly be styled *The Yale University Scheme*. It differs in many important particulars from that of any other institution in the country ; and I would ask special attention to the elevated views and system of study of the Scientific section of the University, and its coördination with the Classical or Academic section.

J. D. D.

## The Yale University Scheme.

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1. The Classical or Academic and the Scientific departments (ordinarily called Yale College, and the Sheffield School of Science) are distinct colleges for the undergraduate students of the University—distinct in teachers, scholars, buildings, apparatus, and special working libraries. They have in common a general library, and the officers meet for the discussion of University questions in a common University Faculty.
2. In each college the first two years of the four\* are years of preparatory study without optional or elective courses, except perhaps in place of the higher mathematics of the second year. After the close of the second year a number of elective courses are before the student.
3. In the Academic College—whose special subjects of study are the classics, modern languages, mathematics, astronomy, history, intellectual and moral philosophy, political economy, general literature, etc.—the principles of natural science, physics and chemistry are taught so far as is necessary to give depth and breadth to an academic education; a general knowledge of the laws or

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\* The three-years course of the Scientific School will probably be made a *four-years* course within a year or two.

systems of nature, both organic and inorganic, being essential in these days to a true scholar, whatever his purpose in life.

4. In the Scientific College—whose special subjects of study are the various natural sciences, physics, chemistry, mathematics, and the practical applications of these sciences—literary subjects are added, including the modern languages (some knowledge of the ancient languages being required for entering), political, moral and intellectual science, history, physical and political geography, etc.—in order to give in this branch of the University a thorough and well rounded education, and make the graduate a man of high culture.

5. In the Academical College, optional or elective courses are confined to its special subjects of study: (1) the classics, (2) modern languages, (3) English language and literature, (4) mathematics. None are allowed in the departments of natural, chemical, or physical science, as these subjects are admitted into this college only so far as is necessary to give that breadth and depth to education which every graduate should have.

6. In the Scientific College also, elective courses are confined to its special objects of study—that is, to the natural sciences, physics, geology, metallurgy, mechanics, engineering, etc.

7. The Post-graduate courses of the University comprise many distinct departments in the lines of the Academic and Scientific Colleges. Connected with the *former*, there are (or may be) courses in Latin, Greek, dif-

ferent Oriental languages, linguistics, English language and literature, history, intellectual philosophy, mathematics, astronomy, etc., etc. Connected with the *latter* there are (or may be): First, in *pure science*, courses severally in the different physical sciences, general chemistry, organic chemistry, mineralogy, botany, zoölogy, paleontology, geology, mathematics, astronomy, etc.; Secondly, in *applied science*, courses in civil engineering, mechanical engineering, mining and mining engineering, practical mechanics, metallurgy, agriculture and agricultural chemistry, etc.

8. The students of the Academic College take, on graduating, the degree of Bachelor of Arts; and those of the Scientific College, that of Bachelor of Philosophy.

The students of the *post-graduate* courses, after two years of study, in which high scholarship is attained as tested by a rigid examination, take the degree of Doctor of Philosophy; except in the case of students in Civil Engineering, who may receive that of Civil Engineer after *one* year of study.

The University includes also the Schools of Law, Medicine, Theology and the Fine Arts. But of these it is not necessary here to speak. Neither of them has, in any part of its curriculum, an undergraduate department analogous to that of the Academic or Scientific College.

In connection with the above brief statement I offer the following remarks:

1. The ranges of studies in the two Colleges, the Academic and Scientific, are so diverse in character, that the interests of the students and of education are better subserved by two distinct faculties working separately, than by one single combined faculty. There is not in the Yale Scheme that multiplicity of optionals before the students, after they have entered the University, which inconveniently subdivides classes, offers inducements to indolence, and tends to break down thorough discipline and study; for, in the act of entering, the student decides as to the range of his optionals; and if afterward not satisfied (which would seldom be the case) he can join the other College.

2. It might be supposed that the scheme would require an unnecessary duplication of professors. But this is not so at Yale. In the Academic College there are already four instructors in Greek, four in Latin, five in mathematics, physics and astronomy; and the professors of rhetoric, history, moral and intellectual philosophy, etc., are more than well occupied with their academic labors. The Scientific students, if embraced in the Academic College, would actually require as many additional instructors as are needed under the existing system of the university.

3. In some scientific departments in the Academic College (zoölogy and botany, for example), in which the instruction occupies but a small part of the college course, there is no objection to employing the services of some of the Scientific faculty, if this is feasible; and,

## THE YALE UNIVERSITY SCHEME

where possible, the Academic faculty may serve the Scientific College. Moreover, while all lecture rooms had better be separate, the more costly kinds of apparatus may well be used in common, in order to avoid needless expenditure.

4. It may be added that many Scientific students commence their training as scholars by first graduating in the Academic College. For the higher training in Science, such a preparatory course in the classics is believed to be eminently desirable. They then enter an advanced class in some one of the departments in the Scientific College, and take the degree of Bachelor of Philosophy, or of Civil Engineer; or by special proficiency, after two years of study, that of Doctor of Philosophy. The Scientific College also admits of partial courses of study which do not lead to any degree.

5. The modification in American colleges which is demanded by the vast development of the sciences of nature within the past century—the era of origination for many of them—and also by the cotemporary progress of linguistic and other sciences, is accomplished by the Yale scheme through a method which does not sacrifice, in any degree, classical education, and which at the same time, combines thorough literary culture with the widest range and highest development of scientific education. The Classical College stands beside the Scientific, open to all who desire to commence with a classical basis; and the Scientific College offers a thorough and liberal education for all who would pursue a more distinctively scientific course.

§. 13. THE YALE UNIVERSITY SCHEME.

6. The Yale scheme contemplates no important change in the Classical or Academic College, except in the elevation of the department of modern languages and literature, and its ideal with regard to modern languages cannot be wholly realized until a knowledge of French and German is given (like that of Latin and Greek) in preparatory schools, and required for admission to the college.

7. The great change that has taken place at Yale is in the introduction of its School of Science. This school is not the result of any preconcerted plan on the part of the university. It is a gradual growth of the past twenty years, urged on by the demand in the land for scientific knowledge among lovers of science, those seeking to become its teachers, and others interested in its practical departments; and it has been carried forward to its present organization mainly through the labors and judgment of the scientific men who have been slowly gathered into its faculty. More than two-thirds of its endowments are due to private munificence, and the remainder to the National agricultural and mechanical fund.

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